WHAT IS CLAIMED IS:

1. An optical amplifier comprising:

an amplification medium having a light propagation region which is doped with a rare earth element and in which light propagating therethrough is amplified by the supply of pumping light with a predetermined wavelength;

a pumping light supplier for supplying pumping light, whose wavelength is set such that a gain variation spectrum of said amplification medium depending on temperature becomes smooth, into said amplification medium; and

an equalizer for equalizing a gain spectrum of said amplification medium and for compensating for temperature dependence of the gain spectrum of said amplification medium.

2. An optical amplifier according to claim 1, wherein said pumping light supplier supplies the pumping light, whose wavelength is fixed in the wavelength band of 960 nm or more but 990 nm or less, into said amplification medium.

3. An optical amplifier according to claim 2, wherein said pumping light supplier supplies the pumping light, whose wavelength is fixed in the wavelength band of 974 nm or more but 977 nm or less, into said amplification medium.

4. An optical amplifier according to claim 1, wherein an amplification band of said amplification medium includes wavelengths of 1540 nm or less.

5. An optical amplifier according to claim 1, wherein said equalizer includes a long-period fiber grating having a loss spectrum with temperature dependence.

6. An optical amplifier according to claim 5, wherein said long-period fiber grating has a constant period and a constant phase of reflective index fluctuation along its longitudinal direction.

7. An optical amplifier according to claim 5, wherein said long-period fiber grating is fabricated by using an optical fiber comprising a core which extends along a predetermined axis and is doped with Ge, and a cladding which is provided on an outer periphery of said core and is not doped with Ge.

8. An optical amplifier according to claim 5, wherein said long-period fiber grating has a loss spectrum whose variation with respect to temperature fluctuation is 40 pm/°C or more.

9. An optical amplifier according to claim 5, wherein said equalizer includes a filter having a constant loss spectrum with no temperature dependence.

10. An optical amplifier according to claim 9, wherein said filter includes a fiber Bragg grating or a

dielectric interference filter.

11. An optical amplifier according to claim 1, wherein said equalizer includes a plurality of long-period fiber gratings each having a loss spectrum with temperature dependence.

12. An optical amplifier according to claim 11, wherein each of said long-period fiber gratings has a constant period and a constant phase of a reflective index fluctuation along its longitudinal direction.

13. An optical amplifier according to claim 11, wherein each of said long-period fiber gratings is fabricated by using an optical fiber comprising a core which extends along a predetermined axis and is doped with Ge, and a cladding which is provided on an outer periphery of said core and is not doped with Ge.

14. An optical amplifier according to claim 11, wherein each of said long-period fiber gratings has a loss spectrum whose variation with respect to temperature fluctuation is 40 pm/°C or more.

15. An optical amplifier according to claim 11, wherein said equalizer includes a filter having a constant loss spectrum with no temperature dependence.

16. An optical amplifier according to claim 15, wherein said filter includes a fiber Bragg grating or a dielectric interference filter.

17. An optical amplifier according to claim 1,

wherein said pumping light supplier includes a stabilizer for stabilizing a center wavelength of the pumping light to be supplied therefrom.